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(54) A CIRCUIT AND DEVICE INCLUDING A TRANSISTOR AND DIODE

(57) A circuit comprising: a transistor, a base of the transistor being switchably connectable to a signal source; a first diode connected between the base of the transistor, and a reference voltage; wherein the circuit arranged such that when the signal source is not connected to the base of the transistor, a voltage applied at an emitter of the transistor causes a current flow through the base of the transistor and through the first diode such that the transistor is in an ON state; the impedance of the signal source is lower than the impedance of the transistor through the emitter and base; the first diode is selected to provide a current limiting function such that when the signal source is connected to the base of the transistor, current flow through the base reduces such that the transistor switches to an OFF state; and in which the circuit comprises a second diode, the second diode comprised from a semiconductor region that provides the base of the transistor and a further semiconductor region in direct contact with the semiconductor region that provides the base of the transistor; and in which the signal source is connectable to the base of the transistor through the second diode.

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EUROPEAN SEARCH REPORT

Application Number
EP 24 17 1975

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 6 738 855 B1 (GOLDMAN STEVEN J [US]) 18 May 2004 (2004-05-18)	1-3	INV. H03K17/58 H03K17/74 H03K19/20
A	* column 5, lines 34-48; figure 2 *	4-15	
X	US 2016/276335 A1 (LAINE JEAN PHILIPPE [FR] ET AL) 22 September 2016 (2016-09-22)	4-15	
A	* figures 1B,3 *	1-3	

TECHNICAL FIELDS SEARCHED (IPC)

H03K

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	30 October 2024	Meulemans, Bart

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing claims for which payment was due.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

☐ The present supplementary European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims (Rule 164 (1) EPC).

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 24 17 1975

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-3

   Method concerning the switching on and off of a transistor depending on the state of an external signal

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2. claims: 4-15

   Transistor with a number of diodes and doping type arrangements

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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 17 1975

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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30-10-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6738855 B1	18-05-2004	US 6738855 B1	18-05-2004
		US 7093054 B1	15-08-2006
US 2016276335 A1	22-09-2016	US 2016276335 A1	22-09-2016
		WO 2015056040 A1	23-04-2015

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82